# GLINIGAL STUDY OF THE LENS INDUGED GLAUGOMA AND ITS VISUAL PROGNOSIS

# THESIS FOR MASTER OF SURGERY (OPHTHALMOLOGY)



BUNDELKHAND UNIVERSITY JHANSI (U. P.)

#### CERTIFICATE

"Clinical study of lens induced glaucome and its visual prognosis" which is being submitted as thesis for M.S. (Ophthalmology) examination of Sundelkhand University, 1990 by Dr. Remesh Chandre Agarwal has been carried out in the department of Ophthalmology, M.L.B. Medical College, Jhansi.

He has put in the necessary stay in this department as per University regulations.

Dated: September, 10, 1989.

( G.D. GUPTA )

M.S., D. C.M. S.,

Reader and Head,

Department of Ophthalmology, M.L.B.Medical College, Jhansi.

#### CERTIFICATE

Certified that the work entitled "Clinical study of lens induced glaucoma and its visual prognosis" was conducted by Dr. Remesh Chandra Agarwal under our direct guidance and supervision. The investigations, technique and statistics mentioned in the thesis were actually undertaken by candidate himself. His observations have been checked by us regularly.

( des. Jain )

1.100

Lecturer,

Department of Ophthalmology, h.L.B. Medical College, Jhansi (U.F.)

(GUIDE)

### CERTIFICA 2 3

certified that the work entitled "Clinical study of lens induced gleucome and its visual prognosis" was conducted by Lr. Ramesh Chandra Agerwal under our direct guidance and supervision. The investigations, technique and statistics mentioned in the thesis were actually undertaken by candidate himself. His observations have been checked by us regularly.

(G.D. GUPTA)

Reader and Head,

Department of Ophthalmology, M.L.B. Medical College, Jhansi.

( CO-GUIDE )



when it comes to express the heart felt gratitude towards those who were life and soul to this work, my situation is eptly summed up by the limes "when the heart is full, the tongue is silent? words - if they could be adequately used - would perhaps still not suffice in bringing forth the totality of my greatfulness for those concerned. Never the less, I will certainly not spare this fortunate opportunity of conveying my feelings in all their humbleness.

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INTRODUCTION

Lens induced glaucoma is a glaucome which developed secondary to the change in morphology or pathology of the lens.

It may be safely said that while everyone would develop a semile cataract, if he lived long enoughs so also would everyone would obtain a spontaneous cura, if life was sufficiently prolonged.

In India each year about 12 million persons become temporarely blind due to the maturation of cataract out of which several persons become permanent blind due to the unavailability of the treatment and hyper - maturation. Because 65% Indian population live in the villages are illiterate, poor and ignorant, does not know the consiquences of hypermaturation of estaract and they may develop lens induced glaucoma as the curse for their illiteracy, poverty and ignorance. This condition was present since time imemorial but does not come into light due to lack of literature and diagnostic tools. In the last two decades of 19th century some scientist observed the frequent occurance of iritis and rise in the intraogular pressure during

spontaneous cure of senile cataract, suggest some relationship between the spotaneous obserption of lens and development of lens induced glaucome.

of glaucoma in case of long stending mature cataract.

Reuss also found that glaucoma occur in S and iridocy—

ctitis in 3 cases of spontaneous cure of semile cataract.

Gifford (1900) describe the lens induced glaucoma is

a glaucoma associated with hypermature cataract and

urged its prevention by cataract extraction. Further

Verhoeff et al (1922), Enapp (1937), Kaufman (1933),

Heath (1941), Courtney (1942), Sugar (1949), Irvine &

Irvine (1952), Hubersty and Gourley (1953) and recently

Hallen and Hughes (1955) have reported on their experience

with this entity and have discussed its prevention and

appropriate therapy.

pressure is anticipated with the supture of the lens capsule and lens matter streaming into the anterior chamber or if the lens luxated into anterior chamber with the capsule intact. Glaucome of this type which usually has a violent enset with the characteristic pathologic

picture, liquification of the lens cortex open iridocorneal angle and presence of large histiocytes which have engulfed liquified lens material and are obstructing the trabecular meshwork. These features were first described by Leeman, who named the condition phacogenetic glaucoma. Subsequently various workers described such type of cases under different names like lens induced glaucome, lens induced uveitis and glaucoma, phacotoxic, phacogenic and finally phacolytic glaucoma have been replaced by term lens induced glaucoma, at present the lens induced glaucoma have a clearcut clinical picture characterised by -(i) a violent secondary glaucoma in one eye with the semile mature cataract, hypermature semile cataract (rarely intumescent senile cataract). Yet with an open angle, (ii) Normal intraocular pressure and open angle in the other eye and (iii) a prompt relief of symptoms and restoration of vision, after cataract extraction in the affected eye.

Lens induced glaucoma was classified as -

- (h) Lens induced secondary open angle glaucoma (phacogenic) -
  - (a) Phaeolytic glaucoma,
  - (b) Phacoanaphylectic glaucema and uveitis.

- (a) Lens induced secondary angle closure glaucoma-
  - (a) Due to intumescence of lens,
  - (b) Due to sublumation or dislocation of lens.
  - (e) Due to spherophakia, Microphakia.

more frequently in the areas where hypermaturity of the lens seen more often. Illiteracy and poverty increases much more incidence of this glaucoma. This preventable and curable condition though rare in developed countries, is unfortunately still prevelent in our country. The main aim of this study is to evaluate the incidence clinical features, management and visual prognosis of lens induced glaucoma.

REVIEW OF LITERATURE TO A STATE OF THE STATE

#### History :

claucoma and cataract have affected the mankind eversince his emergence on the face of the earth, but their true nature was not recognized by ancient Greeks and Romans. The present form of condition has evaluate only through the age of the research. The word Glaucoma first appear in hippocrates (420 B.C.) togather with the amblyopia in the list of diseases affecting old people. Glaucoma is an ancient Greeks name meaning glare such as silverness of the sky as dull sheen of an eye which has lost its brightness.

Sams ad din (1806) described the glaucoma as a migrain of the eye. An illness associated with pain in the eye, hemicrania, dullness of the humour followed by dilatation of the pupil.

cataract is also a semile problem. It may be safely said that while everyone would develop a semile cataract. If he lived long enough; so also would everyone obtain a spontaneous cure if life where sufficiently prolonged. Some time this spontaneous cure complicated by rupture of the lens capsule leads to rise in intra - ocular pressure.

when the intraocular pressure rises secondary to change in the morphology or pathology of the lens termed as lens induced glaucoma.

which the spontaneous cure of semile cateract is complicated by glaucoma. Reuss (1900) found that out of 34 cases of spontaneous cure of semile cateract glaucoma developed in eight and iritis or iridocylitis in three cases. Gifford (1900) observed that 3 out of four cases had lost their vision due to glaucoma during spontaneous cures of semile cateract. Instances of this condition are cited also by Rollet and Genet (1913), Genzaliz (1919), Daily (1933), Knapp (1937), Box and Ehrlich (1941 - 1946), Sugar (1949) and Scott (1953). Safer (1928) and Kaufman (1933) mentioned that in such cases cholesterol crystals were seen in the anterior chamber.

Smith (1891) observed that obstruction to the outflow of aqueous occur at the pupil or at the drainage angle and in many cases at both site resulting in secondary glaucoma. Erich Seidel (1920) and later on Curran (1920) advocated the idea of blockage of pupil as the cause of glaucoma. Heath (1941) said that

rise in introcular pressure is anticipated with the rupture of the capsule and lens matter streaming into anterior chamber with the capsule intact. The lens mater in the vitreous is a well known cause of recurring iridocyclitis and associated glaucoma.

Finally Barkan (1938) with the help of improved gonioscope devided the condition into closed angle type and open angle type.

#### Classification :

Lens induced glaucoma classified as :

- Secondary open angle lens induced glaucoma. It
  include phacolytic glaucoma and phaceanaphyletic
  glaucoma.
- Secondary closed angle lens induced glauceme, include
  - a). Phacomorphic glaucoma in which shape of the lens changed due to swollen cataractous lens (intumescent stage) or it may be secondary to trauma.
  - b). It may be associated with the dislocation of lens may be either spontaneous or traumatic, spontaneous dislocation are seen in patient with the condition such as marfan's syndrome.

homocystinuria and syphilis, subluxation is partial or complete. In trauma the lens may be partial or completely anteriorly or post-arierly dislocated.

c) Third type is glaucoma seen in the eye with spherophakia, which occur most commonly as a part of marchesani syndrome.

#### Pathophysiology :

eiliary body by the bouncing lens nucleus of a margagnism cataract account for the many cases of phacogenic glaucoma. According to Heath (1941) the lens is capable of causing glaucoma through a number of routes and also that the lens structure has within itself the material to produce glaucoma directly and or indirectly. Once out of its bed, the lens become a margudar and is in effect, a foreign body within the eye.

Sugar (1949) observed that glaucoma developed in cases of spontaneous rupture of lens capsule is due to lens protein which act in three ways -

- Chemical irritation due to texic by products
  of lens hydrolysis.
- Increases protein content of the aqueous which tend to lessen the osmotic differential between the aqueous and the blood serum.
- 3. Hechanical obstruction of the trabecular spaces by lens particles affecting the aqueous out flow.

#### Phacolytic glaucoma -

of 138 cases and observed that lenticular degeneration is essential for the development of this type of glaucema, liquification of the cortex may occur feeally or extensive and in 62% cases the entire cortex was envolved. Degenerative changes were usually observed in the lens epithelum and capsule. Most advanced alteration were observed posteriorly where often the depsule was attenuated markedly. In others the liquified lens corticalmaterial had apparently escaped through the unruptured depsule and could be seen over the surface of the lens and in the anterior chamber, Liquification of the lens cortex a process which may be called phacelysis is tarmed by Krause to be mediated by two

enzymes - protesse 'A' and protesse 'B'. Through their activity, large molecules of lens protein are disinte grated to small molecules, which apparently diffuse through intact though perhapes more permeable lens capsule. The presence of lysed certical material in the posterior and anterior chamber evokes a histiocytic response. Large mononuclear phagocytes collect over the lens surface. These macrophages have a very characteristic appearance once they have become engorged with liquified lens substance, they swell up and become counded. Their cytoplasm is distended with the finally gramular, pale staining, slightly acidophilic particles of the lens material, almost identical with that still remaining within the lens. These mecrophages carried by aqueous flow and become relatively more concentrated in the frido corneal angle. The intertrubecular spaces and the surface of the trabecula become filled with these cells and with free lens material present in the aquous. These macrophages do not agglutinate or form keratic precipitate.

Plock et at (1955) found typical pathological picture in 108 (78%) cases had hypermeture cataract, liquified lens substance in the posterior and anterior chamber and characteristic histiocytic response.

Irvine et al (1952) also supported the same view about the pathology of phacolytic glaucoma.

rurbid aqueous may shows a cloud of punetate irridiscent opecities, they are monomuclear macrophages swellen with the lens protein granule. Goldberg (1967) aspirate the aqueous from anterior chamber through a miliperefilter and demonstrate the highly characteristic phacelytic macrophages.

## Phacoanaphylectic glaucoma :

protein senstize the eye, producing usually a severe and some time milder inflammation characterized by Invasion of the lens by polymorphomuclear laucocytes and monomuclear phagocytes. The presence of giant cells about the lens fragments in the iris and in the pupiliary membrane which often formed. Deposition of conglomerate precipitate on the descements membrane. The presence of cyclitic membrane in the pretracted cases. The lens fragments in the vitreous causes a collection of pus cells in the vitreous as well as on the retina, similar to the keratic precipitate. The pathognomic finding is the combination of polymorphomuclear leucocyte, macro - phages and phagecytised lens material.

weak antigen. There is evidence that certain reaction have an allergic aspect Verhoeff and Lemoine, Burky, Burky and Henten, Irvine and Irvine (1952) described that in cases with the hypermature cataract the lens substance escaping into the eye cavities produces uveitis and glaucoma, pathologically there is marked plasma cell reaction in the iris. If lens material is exueded posteriorly a marked cyclitis with plasma cells and mononuclear phagocytic cells response chouding the vitreous, and deposition of clumps of cells on the retine and on the descemet's membrane.

# Phacomarphic glaucoma :

recognised that rapid swelling of the lens frequently excites a secondary rise in the intraocular pressure. This may occur in two conditions, one is with the rapidly developing intumescent cataract of senile type and other is traumatic cataract caused either by perforating injury or by an operation of discision. The swelless lens pushes the iris forward making the anterior chamber sufficiently shallow to blocks its angle or to permit other factors such as mydriasis to do so priestley.

should be resemble as the primary angle closure glaucoma. There are three differences - (i) the fellow eye in the phacomorphic glaucoma frequently has an anterest chamber of normal depth, (ii) the antecedant refractive arror may be of any type in phacomorphic glaucoma while in primary angle closure glaucoma hyperepia is common and (iii) the mature cataract in the phacomorphic glaucoma reduces the severety of visual symptoms.

#### Displacement of the lens :

A subluxation or luxation of lens wheather it be spontaneous or traumatic is frequently followed by development of secondary glaucoma. Brown (1965) found that glaucoma is not uncommonly associated with congenital subluxation as an isolated finding or as part of marfan's syndrome, marchesani syndrome or less commonly in homocystimuria.

In traumatic cases secondary glaucoma is more common 36 out of 70 cases, Magner (1915); 15 out of 38 cases, M. Mc Donald and Puvnell (1957) and 6 out of 11 cases Calhaum and Magler (1960. In anterior dislocation of lens wheather spontaneous or traumatic an immediate secondary glaucoma is much more common.

Hegner (1915) studied that glaucoma occur in

14 out of 15 cases of anterior dislocation of lens
into anterior chamber. Rodman (1963) found that 34

out of 44 cases of traumatic anterior dislocation of
the lens had a clinical history or pathological evidence
of glaucoma. In traumatic anterior subluxation or
dislocation of the lens secondary glaucoma occur due
to the recession of the angle of anterior chamber,
Rodman (1963), Pupillary block by vitreous or lens.
Chandler (1964) has commented on the frequent occurance
of glaucoma in ectopia lentis, marfan's syndrome,
marchesani syndrome and homocystinuria. Smeral (1962)
and Segal (1962) found that in ectopia lentis, marfam's
syndrome and marchesani syndrome secondary glaucoma
occur due to envolvement of angle of anterior chamber.

In spantaneous anterior dislocation, the less is some time incarcirated in the pupil resulting in the pupillary block glaucoms. If the lens is completely in the anterior chamber the pupil may be blocked by iris carrying forward against the posterior surface of the lens lead to formation of extrinsic anterior peripheral synechia which hinderd the aqueous flow, Rodman (1963), Chandler (1964).

lens, some time glaucoma characterize the marfan's syndrome. In 80% of the cases the lens is spherical in shape and dislocated upword. Hieroscopically the engle of such eye shows a thickend anamalous trabecular meshwork with a large number of trabecular sheets passing the scleral spur and inserting directly into the ciliary body. Increased intraocular pressure is pruduced by trabecular anamaly as well as dislocation of lens. Homogystinuria is associated with subluxated or dislocated lens was first described by Garson and Reill (1962) and well over 100 cases have since been reported.

origin secondary glaucoma is not so frequent, 2 out of 9 cases. Calhaun and Hagler (1960), Glaucoma occur as a result of trauma not due to dislocation of lens Rodman (1963), Chandler (1964). In spotaneous posterior dislocation, the lens usually well tolerated by eye. In those cases where hypertension occur, it is due to the vitreopupillary block, rubeosis secondary to ratinal detachment, Rodman (1963). Phacoanaphylectic or phacolytic glaucoma, Chandler (1959) or coincident primary glaucoma.

of lens glaucoma occur due to the recession of the angle of anterior chamber (30 out of 31 cases) Rodman (1963).

Microphakia or spherophakia is congenital and bilateral condition associated with skeletal changes may be complicated by glaucoma. Howman (1865).

Marchesami (1939) described a syndrome characterised by spherophakia and actopia lentis giving rise to lenticular myopia and iridodenesis and glaucoma which is probably due to spherophakia. Spherical lens blocking the pupil leads to pupillary block glaucoma. Repeated self limitinggattacks of glaucoma may ultimately result in the formation of extensive peripheral anterior symethia and permanent increase in the intraocular pressure, Gartner (1958), Zoldin (1959), Levy and Adreson (1961).

# Incidence :

the various types of secondary glaucoma was studied by different workers as follows:

Shows incidence of phacogenic glaucoma in relation to secondary glaucoma

0.	Scientist	Total no. of case studied	No. of case of lens induced glaucoma	
1.	Lehrfeld and Reber (1937)	413	80	19.4
2.	Kurland and Taub (1957)	14	delli	4000
3.	Ymazi et al (1977)	761	38	5.0
4.	Agarwal H.C. et al (1982)	1065	231	12.4

Theogenic glaucoma included, glaucoma due to the pupillary block associated with the intumescent or hypermature morgagnian cataract, phaeolytic glaucoma, phaeotoxic glaucoma and secondary glaucoma associated with displacement of the lens.

The incidence of lens induced glaucome in relation to the total number of senile cataract operated was observed by various workers is given in table - 2.

Table - 2

Incidence of lens induced glaucoma in relation to total no. of senile cataract operated

S \$240 Y	Total no. of cataract operated	No. of case of lens induced glaucoma	Percent.
Jain, I.S. et al (1982)	2719	108	3.91
Ohar G.L. et al (1984)	6294	214	3.40

The incidence of sex observed by various workers is given in table - 3.

Table - 3
Relationship of age & sex incidence

01.	Scientist	Average age (years)	Total no. of case studied	No.(%)	No.(%) of female
1.	Flock et al (1955)	70	138	82 (59,43%)	56 (40.57%)
2.	Jain 1.5. et al (1982)	62	\$6	40 (46.57%)	46 (53.49%)
3.	Dhar G.L. et al (1988)	65.5	214	93 (43.46%)	121 (56.54%)

Flock et al (1955) observed that male sufrer 59.43% were dominating over females 40.57%. In further studies Jain et al (1982) and Dhar et al (1984) found that females are out numbered the males.

#### Clinical feature :

violent secondary glaucoma (resemble acute angle closure glaucoma) in the one eye with the semile mature cetaract, hypermature semile cataract (rarely intumescent semile cataract) yet with an open angle. Normal intraocular pressure and open angle in the other eye and a prompt relief of symptoms and restoration of vision after cataract extraction in the affected eye.

## Symptoms and signs :

prior to the onset of acute glaucoma. The second group of symptoms are related to the onset of glaucoma, which in most cases was sudden and varried little from the well known picture of acute congestive glaucoma. Cculer and periorbital pain, headache of varrying severity, nausea, vomiting and prostration. The eye was usually congested and shows corneal oedema, aqueous flare, fixed often dilated pupil and shallow anterior chember or

deeper enterior chamber, may be subluxation of lems, raised intraocular pressure and cataractous lens.

eases, mature intumescent cataract in 126 (58.5%)
cases and immature cataract in 5 (2.5%) cases. Mean
intraocular pressure in the affected eye was 36.6 mm
Ng ± 7.4 mm Ng. The highest recorded tension 60.3 mm
Ng and lowest was 26.6 mm Ng. schiots. The other eye
invarriably was quite with sphakia in 96 cases, immature
cataract in 64 cases mature senile cataract in 38 cases
and hypermature senile cataract in 16 cases.

# Secie - economic status :

economically on account of percapita income. Person having per capita income & 300 - 600 or above categorized into upper class & 139 - 299 in middle class and bellow & 139 in lower class.

#### Menogement :

According to Dhar et al (1984) first of all intraocular pressure should be controlled by acetasolemide
esmotic agent like oral glycerol, 20% mannital (1/v)
and timolol eye drop in different combination alongwith

local antibiotic drop. Surgical treatment was carried out as quickly as possible after an initial medical therapy. Cataract extraction was performed in single stage alongwith the peripheral iridectomy or other filtering operation, Heath (1941), Sugar (1944), Jain et al (1982), Dhar et al (1984).

# rug review :

Different drugs used to reduce the intraocular pressure.

#### cetasolamide :

the production of aqueous by about 50% (Backer and Bay (1958); Draeger et al (1963)). It is given orally in the dose of 125 - 500 mg, one to four times a day and after single dose its action is apparant in 60 - 90 minute, reach a maximum in 3 - 5 hours and wearoff in about 12 hours. Sustained action capsule of the drug have a more prolong effect did not be given more than twice a day (Stepanic, 1967).

#### smotic agent :

These substances raised the esmolarity of the plasma so that fluid withdrawn from the eye resulting in fall of intraocular pressure. Movement of the ocular fluid is established when there is defenitive concentration gradient, Galin et al (1959).

- Various indications for uses of osmotic agent
- Angle closure glaucoma
- Secondary glaucoma (Hypermature, phacolytic glaucoma.
- Treoperative

#### Lrea :

First used osmotic agent Adler (1933), it induces marked hypotomy Aizawa (1962).

# Mannitol:

According to Galin et al (1963), it has less side offect than urea. Fore potent hypotensive agent than urea Seeger and Lewis (1964), it is used intravenously.

with their route of administration and doses.

Shows different essetic agent with their route of administration and dose

Hame	Route of administration	Dose	
	的表现,但是一种的人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们也不会	· · · · · · · · · · · · · · · · · · ·	
lycerol	Oral	1-1.5gm. 1 kg.	
thylalcohol	Cral	0.1-1.5gm. kg.	
sosorbide	Oral	igm. kg.	

#### Side effects :

Dehydration of body cause, headache, pain in the back, mental confusion, disorientation, Tarter and Linn (1961), Becker (1967).

Diwresis is enhanced markedly with mannitol and they must be used with caution in patient with the cardiac, renal and hepatic diseases.

# Betablockers :

As early as 1967 Philips, C.I., Howitt, G. and Rowland, J.J. introduced propranolol into glaucoma therapy. However because of its mild anaesthetic properties, have made many investigators reluctant to use it as a topical medication for glaucoma.

blocking agent timolol. It blocks both beta and beta receptors. Timolol has neighbor sympathomimetic effect nor ensesthetic properties fitz Gerald J.D. (1971). The abscence of local ansesthetic activity appears to make timolol a more resonable choice for local use in long term therapy. In animal experiments, Hall R.A. et al (1970), Scriabine A. (1973), it is proved that it has 5 - 6 time greater activity than propranolol. It is levo isomer which is usually employed. Kat's and his associates (1976) reported single eye drop study uses 0.5% and 1% and 1.5% timolol opthalmic solution in 15 normal volunteers.

Intraocular pressure were decreased significantly in comparision to 15 control. Fo side effect were observed, in particular, there was no ocular irritation, no alteration in the pupillary size and no change in the visual acuity. Zemmerman and Kaufman (1977) conducted a single eye drop study on 30 patients with glaucoma and found significant lowering of intraocular pressure with timolol drops. A 50% reduction in the intraocular pressure was estimated when pressure reading at seven hours after the eye drops were compared with the pre-treatment level.

They also conducted a dose response analysis to a single eye drop in 20 glaucome patients. They concluded that maximum effect was achieved by a concentration of 0.5%. They also noted a prolong duration of action still present atleast 24 hours after the eye drops. Timelol was used and found to be much effective as compared to pilocorpine. The result of William F., Boger et al (1978) also confirmed these findings.

# restment of phacolytic glaucoma :

giving carbonic anhydrase inhibitor and osmotic agent then performed surgery. Robert H. et al (1964) studied that this glaucoma is misdiagnosed as angle closure glaucoma and iridectomy was performed. Flock's and co-workers pointed out that sudden onset and symptamology are often very similar to those of acute angle closure glaucoma. This probably was the reason for iridectomy in these cases. Juring operation ciliary body was torm and there was hasmorrahage into anterior and posterior chamber. Infact red blood cells as well as the product of breckdown erythrocytes acting in the concert with macrophages attached by the escaped lens material.

produced further mechanical blockage and aggressate the glaucoma.

of this condition by removal of the lens. Flock and co-workers (1955) stated that after delivery of the lens the anterior chamber should be irrigated in an effort to remove as much as morgagnian fluid and as many macrophages as possible. Her (1984) in his study of 214 cases initially controlled the intraocular pressure by 20% mannitol and glycerol (grally). Dismost and or timolol in different combination with the local antibiotic drop. After that performed surgical procedure, cataract extraction alongwith the peripheral irridectomy (single stage) operation in 210 cases and in 4 cases surgery was carried out in two stage a preliminary peripheral irridectomy followed 2 weeks after cataract extraction.

## Phace anaphylectic glaucoma :

In this case corticosteroid therapy is usually minimally effective. Cure of the condition depends on recognition and extraction of all lens material

## intumescence of the lens :

In this introcular pressure reduced by medical means such as carbonic anhydrase inhibitor. Camotic agent and when tension was reduced to normal level lens is removed by extraction (in intrumescent stage) or curettee evacuation or aspiration (in traumatic cataract).

Jain 1.5. et al managed 86 eyes of this type
of glaucome. He controlled the intraocular pressure
by medical means and then intracepsular cataract
extraction was done in 49 (57%) eyes. Planned extracapsular cataract extraction in 9 eyes and combined
extraction with trabeculectomy in 9 eyes.

## islocation of lens:

In spontaneous subluxation or luxation, treatment of choice is extraction of the lens. In homocystinuria an anteriorly dislocated lens producing an acute plaucoma. The dilemma is wheather to extract the lens or to coax it back through the pupil in the hope that subsiquent missis will prevent recurrent dislocation.

Clarke (1939) argued that is anteriorly dislocated lens, the lens extraction was justified. Chace (1945) reported the result of operating upon four cases of congenital bilateral subluxation of lens but concluded that the result in all cases were unsatisfactory. Chamdler (1964) deplored the practice of extracting the dislocated lens and advocated for a peripheral irridectomy to eliminate the pupillary block in forward movement of the lens. Speath and market (1965), Thomas, collowell reter, Cargell and Lester (1966) and Gardon, Carstan Hart and Pollitt (1978) reported the extracting enteriorly dislocated lens in patient with the homocystinuria vitreous was invarriably lost. Jhomston (1968) described the removal of 6 lenses from the patient with the homocystinuria.

placecome due to anterior dislocation of lens. Elkington (1973) in his study gave openion that an anteriorly dislocated lens in a patient with the homogystimuria should be managed medically, when ever possible. If the lens can not be replaced behind the iris by medical means, it should be reposited under general anaesthesia and peripheral irridectomy performed. In a child or young

audult would it appear resonable to extract the lens.

In traumatic dislocation the probability that the lens will rapidly become catmactous and required extraction.

Spherophakia:

For this type of glamcoma the treatment is difficult. The condition usually paradoxical in that the use of miotics may lead to the rise in the tension (inverse glaucoma), Urbanick (1930), Robert (1953), which can be reversed by mydriatics. Extraction of the lens generally by means of vectis has frequently been advocated but has not always lead to relief. Reedling of a spherophakic lens does not lead to absorption.

Jack Levy and Anderson (1961) studied and found that irridectomy Abexter no performed at an early stage in the filteration angle is appear to be simple and good procedure. Support of this view by Rosenthol and Kloepfer (1956). Once the angle of anterior chamber closed some form of drainage operation is necessary i iridenclesis or cyclodialysis).

The complication noted by Dhar G.L. et al (1984) are - Corneal haze, Hyphema ( Post operative ), Shallow anterior chamber, Rupture of the lens capsule, Vitreous prolapse and Hazy media.

## Visual prognosis

Jain I.S. et al (1982) observed that eyes tend to with stand raised intraocular pressure for a longer period than expected and observed that visual prognosis in the lans induced glaucoma depend upon the time interval between the emset of acute attack and starting of treatment and found the visual prognosis as following.

Dhar G.L. et al (1984) in his study observed the visual prognosis as follows :

Showing the visual acuity among the operated cases of lens induced glaucoma

81. No.	Scientist	6/18 No.	01 B019	6/24 No	07 J. 1998 X	No.	23
1 .	Jain I.S. et al (1982) (36 cases)	56	(62.8%)	20	(23.3%)	12	(13
2.	Dhar G.L. et al (1984) (214 cases)	169	(79,0%)	36	(16.8%)	09	(04

MATERIAL AND METHOD

The present study was carried out in the department of Cphthalmology, M.L.B. Nedical College and Hespital, Jhansi between July, 1988 to June, 1989. The patients selected have marked visual deffect because of the advanced lenticular opecities and raised intraocular pressure. The patients suffering from lens induced glaucoma were taken up for the study.

from 35 years to 80 years. Number of eyes underwent surgery was 36. The minimum follow up period was three month. The surgery was done by the consultant surgedn of the department.

#### The method :

The following pattern was addopted for almost all the patient:

## History of present illness :

History of headache and eyeache, its severity, duration and association with vomiting, diminution of vision, redness and watering of eye. History of anti-glaucoma therapy was asked, if any.

### Past History :

Regarding previous attack of some disease trauma, vomiting, diabetes or visual disturbances,
if any noted.

## Personal History :

Symptoms relating to diabetes and hypertension were asked and addiction to any drug was recorded.

## Examinations :

## Systemic -

Recarding of pulse, blood pressure, temperature examination of cardio - vascular and respiratory system.

## Local -

The local examination was done under bright illumination with the help of uniocular corneal loppe (10 x) and + 13D condensing lens. By this we examine the conjunctive, cornea, enterior chamber, iris pupil and lens.

The slit lamp examination was done routinely particularly to examine, transparency of cornea, aquous flare, keratic precipitates, extent of the lenticular opacities and pigmentary desperson over lans to elicit pupillary reaction or perception of light in doubtful cases.

### Investigations :

### Routine -

It include urine albimin and sugar in all the cases and when ever indicated blood sugar, total leucocyte count, defferential leucocyte count blood haemoglobin, erythrocyte sedimentation rate etc.

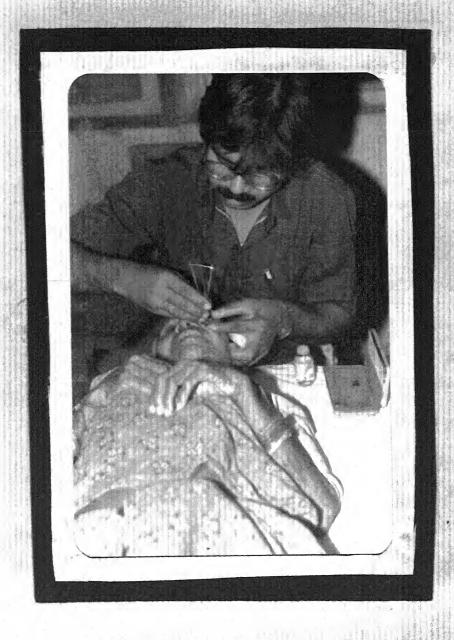
### Special -

- of smellen's test type, finger counting, hand movement, perception of light and projection of rays depending on the indeviduals visual status. The best corrected visual acuity was recorded in post operative and follow up period.
- (2) <u>Pupillary examination</u> Pupil of the both eyes were seen for -
  - Pupillary reaction,
  - Size of the pupil and
  - Shape of the pupil.

Fupillary reaction-direct and consensual pupillary reaction were seen with the help of spot light.

Size and shape of the pupil were assessed with the help of terch.

- (3) Tonometery It was performed with the schiot's tonometer with standard technique. Almost in all the cases, except in incooperative patient, where only digital tonometry was done, one perticular schiot's tonometer was used preoperatively post operatively and in follow up period.
- Fatient was asked to lie down in supine position looking straight at the ceiling of the examination room.
- watill local anaesthesis was complete.
- Both eyes lids were separated with the finger without pressing on the eye ball and then the tomometer was placed vertically on the cornea so that it rest by its own weight.
- Depending on the tension of the eye there was a deflection of the recording needle on the scale.
- . The reading on the scale was then translated from the conversion chart into milimeter of mercury.



PHOTOGRAPH SHOWING SCHIOTZ TONOMETRY (LEFT EYE)

- (4) <u>Fundoscopy</u> Both distant direct and direct aphthalmoscopy were done post operatively by Keeler's mediclux ophthalmoscope. The candition of the optic disc such as size, shape, colour, excavation masal, shifting of vessels and disc cup ratio were noted. Beside this any abnormality in the fundus was recorded.
- patients by Coldman's three mirror Gonioscope to
  assess mainly the angle status (open or closed). Beside
  these the peripheral enterior synechia and neovasularisation of the angle, if any were noted.

when the desired investigations were done the patient was subjected for medical therapy followed by surgical intervention. Whenever the operation was delayed the patient was put on acetasolamide and timelol eye drop.

## Preoperative preparation :

The patient were mentally prepared to undergo cataract extraction with sector iridectomy or combined surgery. To relieve the apprehension, emxiety and to have good sleep night before the operation dissepan Smg tablet was given. The eye lashes were cut a day before.

The intraocular pressure was controlled with acetasolemide 250 mg tablet in suitable doses. Two ounces of glycerol with equal amount of water as a single dose therapy, when tension was not controlled, intravenous mannitel 20% was injected an hour before the operation. To premedicate the patient, injection pentasocine 30 mg and injection phenargan 50 mg were given intramascularly half an hour before the operation.

### Amaesthesia :

Topical - By instillation of 4% lignocain 4 - 5 times at 2 minute interval.

Regional akinesia - It was obtained by 2% lignocain with adrenalin by O'Erien's method preferably and when ever essential by vonlint's technique too.

Ciliary block - By 1 ml. retrobulber injection of 2% lignocain with adrenalin followed by ocular massage for 3 - 4 minutes.

## Steps of operation :

The operation was done under 3x magnifications by magnifying glasses. After the lid and superior rectus suturing, a limbal based conjunctivel flaps was formal

over the superior 180 degree approximately 4 m.m. from limbus at 12 O'cleck position and gradually tapperd down closed to the limbus at 3 and 9 O'cleck position. Flape was reflected over the cornea and limbus cleared. The superfecial vessels were thermally cauterized.

Then with the help of blade eater the anterior chamber at 12 0°clock position. Corneal scissors was then introduced into the asterior chamber through already formed incision, to extend the corneal section passing through the preformed groovs. An inidectomy was performed after the completion of the section. After releasing the superior rectus muscle suture lens extraction was done by eryoprobe / forceps / vectis or as indicated otherwise. Intra capsular cataract extraction was planned in every case.

In some cases a whip like iris pillar reposited in the sub conjuctival space (iridenclesis) alongwith the cataract extraction. In some cases trabeculectomy alongwith the lens extraction was done.

reposited and corner seleral stiches were given with 8 - 0 virgin silk or 9 - 0 manofilament. Them conjunctival flaps were reposited and stiched contineemsly with 8 - 0 silk suture. The sterile air was injected to reform the anterior chamber. Sub-conjunctival injection of decadron 1 mg. and gentamicin 10 mg. was given. The operative complications were managed as in the routine cataract extraction. After applying the plain antibiotic eye cintment the eye was bandaged.

## Fost Operative management :

chloramphenical 250 mg. 4 times a day or cotrimoxasale double strength 1 tablet twice a day with anti inflamatory drug were given to all the patients, for 3 days atleast. Daily dressing was done with corticostereid and antibiotic eye cintment, 1% atropine was added in the case of iritis of in whom sector iridectomy was performed. Injection gentamicin, decadrom and atropine were given sub - conjunctively when indicated.

post-operative detailes were noted. Particular attention was paid to the condition of section wound, striate keratitis, depth of the anterior chamber hyphema and any sign of iritis and were managed accordingly. In uncomplicated cases the conjunctival and corneceleral stickes were removed on the 8th day and the patient was discharged subsiquently with the follow up treatment and advise.

### The follow up :

The patient were advised for follow up examinated on at 15 days after discharge then at one month duration. Aphabic correction was done at one and half month after the operation. Final examination was done at 3 months after operation.

At the follow up the eye was examined for any infection, transparency of cornea, depth of emterior chamber and condition of the iris. Fundoscopy was done to evaluate the condition of disc. More emphasis was given on corrected visual equity and intraocular pressure. All the findings were recorded for the final assessment.

OBSERVATION

and its visual prognosis was carried out in the department of Ophthalmology, M.L.B. Medical College and Mospital, Jhansi. During this period 36 patients were studied out of which 7 patients were operated for glausoma only on first stage. After that they were not turned up for 2nd stage operation, that is less extraction. Twenty mine eyes were operated for both glausoma and cateract and were followed up. The follow up of the patients varried between 15 days to 3 months. The average follow up being one and half month.

## Incidence |

Thirty six cases of lens induced glaucoma were recorded over this period of study, contributing about 10.6% of the total 339 cases of semile category admitted for gataract extraction.

## Age & sex incidence :

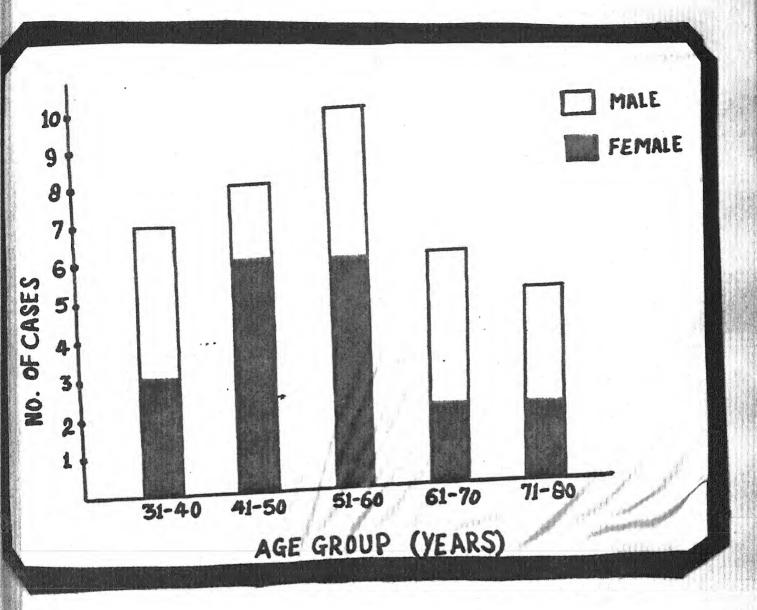
The age and sex of the petients are shown in table no. 1.

Table no. 1
(Distribution of age & sex of patients of lens induced glaucoma in 36 eyes)

81. No.	Age gr (year	a)	No. pat	of x	Male pat nts	1.0-	Pow pat: nto	le-
1.	31 -	40	07	19.44	04	11,11	03	8.33
2.	41 -	50	08	22.22	02	5.55	06	16,66
3.	81 -	60	20	27.77	04	11.11	06	16,66
4.	61 -	70	06	16.66	04	11,11	02	5.35
5.	71	80	05	13,88	03	8,33	03	5.55
	Total		36	100,00	17	47.22	19	52.78

The age of the patients varied between 35
years to 80 years. The average age of the patient
was \$5.7 \to 12.46 years. Age group 31 - 40 includes 07
(19.44%) patients out of these 4 were males and 3 were
females. Age group 41 - 50 years includes 8 (22.22%)
patients, the number of males and females in this group
was 3 and 6 respectively. The maximum number of patients
recorded in the third group that is 6th decade were 10
(27.77%) out of which 4 males and 6 females.

The minimum number of 5 patients were in the age group of 71 - 80 years in which 3 males and 2 were females.



GRAPH SHOWING AGE & SEX DISTRIBUTION IN PRESENT STUDY The total number of male patients were 17 (47.22%) while female 19 (52.78%).

Table no. 2

(Duration of acute attack in lens induced glaucoma in 29 eyes, operated for both cataract & glaucoma)

Sl. No.	Dureti ett	on of acute ack (days)	No. of eyes	Percentage
orem.	(A)			
1.	6	2	5	17.24
2.	3	- 5	7	24.13
	(3)			
1.	6	- 10	6	20.68
2.	11	- 20	- 4	13.79
3.	7	20	7	24.23

The patients were further devided into two groups, according to the duration of onset of discoup 'A' included patients of 1 to 5 days of dust of onset of acute attack and Group 'B' included point of duration of illness of 6 days onwards.

The total number of male patients were 17 (47.22%) while female 19 (52.78%).

Table no. 2

(Duration of acute attack in lens induced glaucoma in 29 eyes, operated for both cataract & glaucoma)

81. E	aretic	on of acute ack(days)	No. of eyes	Percentage
Group	(A)			
1.	6	2	5	17.24
2.	3 -	- 5	7	24,13
GTOUD.	(B)			
1.	6	- 10	6	20.68
2.	11	- 20	4	13.79
3.	7	20	7	24,13

The patients were further devided into two groups, according to the duration of enset of disease. Group 'A' included patients of 1 to 5 days of duration of enset of acute attack and Group 'B' included patients of duration of duration of filmess of 6 days enwards.

The former group include 12 (41.37%) out of 29 cases while the later group included 17 (58.62%) petients. This was done for statistical evaluation of results in two group to know the effect of duration of illness.

In all the duration of acute attack varried between 1 to 60 days. 5 (17.24%) eyes presented with acute attack within 2 days, 7 (24.13%) eyes between 3 - 5 days, 6 (20.68%) eyes between 6 - 10 days, 4 (13.79%) between 11 - 20 days and 7 (24.13%) eyes presented with the acute attack more than 20 days. In group 'A' 12(41.37%) eyes present with the acute attack upto 5 days while rest 17 (58.60%) eyes had history of attack more than 6 days.

As for as the side of eyes was concerned 15 (41.66%) were left while rest 21 (58.33%) were right.

We further devided the patient came from Urban or Rural area. The number of patients came from Urban area were 12 (33.33%), while from Rural area were 24 (66.66%).

(Shows the number of cases belong to different socio-economic class)

Sl.	Secio-economic class	Per capita income (Rs.)	No. of cases	Percentage
1.	Upper class	600 or above	0	0
2.	Upper middle elass	300 - 599	0	0
3.	Middle class	140 - 299	02	5.55%
4.	Lower middle	60 - 139	10	27.77%
S.	Lower class	less than 60	24	66.66%

We also devide the patient according to their socio - economic status. There was no patient from upper & upper middle class. Only 02 (5.55%) patients belong to middle class and 10 (27.77%) patients were from lower middle class and 24 (66.66%) were from lower class.

## Prosentation of symptoms :

The patients presented with gross visual deficit because of the edvanced lenticular opacity and glaucoma.

The patients with the lens induced glaucoma presented with the gradual diminution of vision super imposed with moderate to severe headache and sudden to scute onset of pain.

The most symptoms were of scute onset except
the diminution of vision, which patients had for months
and years. The symptoms complained by the patients
in order of frequency are recorded in table no. 4.

Table no. 4

(The different symptoms in lens induced glaucoma in order of frequency in 36 cases)

31.	Sympton	No. of patients	percentage
1.	Diminution of vision	36	100,00
2.	Bye pain	36	100,00
	Redness	36	100,00
	Headache	31	82.20
	Nauses vomiting	14	38.80
5.	Swelling of the lid	07	19,44
7.	Webering of eye	07	19.44

Diminution of vision, eye pain and redness of eye presented in all the cases of less induced glaucoma 31 (82.20%) case had headache, 14 (38.88%) patient had nausea / vomiting at the time of enset of scute attack, only 7 (19.44%) patients had lid swelling and watering of eye.

### Signs :

Examination of the cases of lens induced glaucome revealed the following signs were given in table mo. 5 in order of frequency.

(Signs revealed in cases of lens induced glausome in order of frequency)

Sl. No.	\$1gn	No. of patient	Percentage
1	Circum corneal congestion	36	100,00
2.	Dilated pupil	36	100.00
3.	Shallow anterior chamber	36	100,00
4.	Deffective vision -		
	PL/PR = 22 ; Culy PL = 02 ) Doubtful Ph = 11 )	36	100.00
S .	Raised intraocular pressure	35	97.22
6.	Senile cetaract	31	86,11
7.	Hasy cornes	20	55.55
8.	Conjunctival congestion	20	55.55
9.	Lid Cedema	06	16.66
10.	Aqueous flare	05	13.89
11.	Traumatic cateract	05	13.89
12.	Open angle of anterior chamber (done in 6 cases)	06	100.00



PHOTOGRAPH OF A CASE OF LENS INDUCED SECONDARY GLAUCOMA (LEFT EYE) The circum corneal congestion, dilated pupil, shallow enterior chamber and diffective vision found in all the cases. Raised intraocular pressure were observed in 35 (97.22%) eyes where as only one (2.78%) petient had low tension inspite of all other signs are present.

Only in 1 patient hand movement was present. In 22 patients PL/RR were present, 2 patients had only perception of light and 11 patients had doubtful PL.

On slit lamp examination observed that 5 patients had equeous flare.

Genioscopy was done in six patients and all were having open angle.

The signs of iritis were observed in patients were given in table no. 6.

Table no. 6
(Patients shows sign of iritis in 36 eyes)

81.3	10.	Sign	No.	of	Cose	Pere		tage
1.	Iritis	present						
		a) Symechia	6	)	11	16,76	1	30-55
		b) Aqueous flare	5	)	49	13,80		
2.	Iritis	not present			25			69.44

Iritis was observed in 11 (30.55%) cases in which it was present in the acute form with synechia/

# Type of lens induced glaucoma :

The verious type of lens induced glaucoma in 36 eyes were shown in table no. 7. The diagnosis of different type of glaucoma was based on history clinical examination, slit lamp examination etc.

Break up of pre - operative diagnosis as related to type of glaucoma in 36 eyes.

Table no. 7
(Type of glaucoma in 36 eyes)

51.8	io. Type of glaucoma	No.of case	Percentage
1.	Phacotoxic	29	90.55
2.	Phacomorphic	04	11.11
3.	Traumatic (anterior dislocation)	03	08,33

The maximum number of patients that is 29
(80.55%) had phacotoxic lens induced glaucoma, 4 (11.11%)
phacomorphic glaucoma and 3 (8.33%) traumatic lens
induced glaucoma in which lens dislocated anteriorly.



PHOTOGRAPH OF A CASE OF LENS INDUCED GLAUCOMA DUE TO TRAUMATIC ANTERIOR DISLOCAT-ION OF LENS (RIGHT EYE)

### Type of cataract :

The different types of cataract found in cases of lens induced glaucome are given in table no. 8.

Table no. 8 ( Type of cataract in 36 eyes )

Type of cataract	No.ef	patient	Percentage	
Immeture cataract	1		2,77	
Mature cataract	4		11.11	
Nature cataract with swollen lens	3		8.33	
Mature dislocated anterior	3		8.33	
Hypermeture estaract	25		68.83	

Though the evaluation of cataract was done preoperatively, its type and extent was further confirmed after the removal, under magnification.

The maximum number of cases found with hypermature cataract were 25 (68.83%) and minimum number was 1 (2.77%) with immature cataract. In 3 cases lens induced glaucoma was associated with mature anteriorly dislocated lens and in 3 cases (8.33%) associated with mature swellen lens blocking pupillary area.

## Pre-operative visual acuity :

The pre-operative visual acuity was diminushed due to lenticular opecity and corneal sedema. Pre-operative visual acuity observed in 29 cases were given in table no. 9.

Table no. 9
( Pre-operative visual acuity in 29 cases )

Visual acuity	No. of eyes	Percentage
Mand movement	1	3.44
PL PR	19	65.51
Caly PL	2	6.89
Doubtful PL	7	24.13

Table no. 9 shows the pre-operative visual acuity of 29 cases with lens induced glaucoma, one (3.44%) eye had hand movements, Only. The maximum number of 19 (65.51%) eyes had postive PL with PR in all the four quadrents. 2 (6.6.89%) had PL only and 7 (24.13%) eyes had doubtful PL.

# Pre-Operative intraocular pressure

The intraocular pressure at the time of admission (initial tension) is shown in table no. 10.

Table no. 19
(Pre-operative intraocular pressure in 29 eyes)

\$1. No.	Duration of acute attacks (day)	No.of	Average pre-operative intraocular pressure (mm / mg )
drou	p (A)		
1.	73	5	35.5
2.	3 - 5	7	46.0
	E (B)		
1.	6 - 10	6	32.66
2.	11 - 20	4	45.05
3.	7 20	7	50.67

Pre - operative average tension was recorded in Group (A) was 40.75 mm/mg and in Group (B) 42.79 mm/mg. The minimum intraocular pressure recorded was 24.4 mm/mg and maximum 69.3 mm/mg with average 41.97 mm/mg.

### Other eve t

The other eye invarriably was quite with aphabia in 8 (22.22%) cases. Immature cataract in 20 (55.55%) cases, mature cataract in one (2.77%) and hyper mature absolute eye in 1 (2.77%) case. In 6 (16.66%) cases the other eye was quite normal.

### Treatment\_s

Pre- operative antiglaucoma therapy - The antiglaucoma therapy was given to all the patients and is shown in table no. 11.

Table no. 11 (Pre-operative antiglaucoma therapy)

Medicine	No. of patient	Percentage
Neetasol amide	7	24.13
Agetamolamide + Piloca	rpine 3	10.34
geterolamide + timolo	1 4	13.79
Agetasolamide + timolo + Glyces	ol 7	24.13
All above + mannitel	8	27.58

Acetasolamide was used in all the 29 patients. It alone controlled the tension in 7 (24.13%) eyes with mild rise of tension. More ever these eyes were operated upon a day or two later.

The tension was controlled in further 4 (13.79%) eyes with timelel and acetazolamide. These two drugs in addition with glycerol further controlled the tension in 7 (24.13%) eyes.

Even with three drugs tension remained high in 8 (27.58%) eyes, so intravenous mannitol was given one hour before surgery.



PHOTOGRAPH OF A CASE OF LENS INDUCED GLAUCOMA AFTER COMBIND OPERATION (RIGHT EYE)

## Intra - operative complications :

The hyphaema was seen in 1 (3.44%) eye that was massive and lead to corneal staining.

Iris injury occured in 1 (3.44%) eye while vitrous prolapse occure in 2 (6.89%) eyes. Rupture of the lens capsule occured in two (6.89%) cases.

# Immediate post-operative compligations :

The complication occurring within 15 days of follow up period were considered immediate or early post-operative complication.

The Striate Keratitis was observed in 19 (65.51%) cases. It cleared in all the cases by the end of 15 days of follow up.

Tritis was seen in 6 (20.68%) eyes it was mild in 4 cases while moderate to severe in 2 cases and was treated accordingly. In one case iritis was associated with massive hyphaema. Shallow enterior chamber was observed in 5 (17.24%) eyes. It was seen from very first day but disappeared within 2 - 3 days.

## Visual processis :

After 6 weeks of follow up aphabic correction was done with the help of spectacles. The corrected visual acuity is given in talle no. 13.

( Corrocted visual semity in relation to duration of semisations o

Duration of attack days		å,	Pro-operative viewal seulty	25 8 5	155	ŠŠ	3 8 8	×	122
Group - A		1 -	Acusate Pt. 7R - 5	~	8		2 (40%)		
	•	w ~	Inscarate PL PR-0						9
8A.89	8-	400	Acutate Pt. PR - 6	***	•	444	eril .		
			Inscurate Pt FR-1	38.48				***	
g - dhoad									
	46	4	Acturate Pl. PR . 5		44	<b>648</b>		•	8
	•	-	3		8	er4)			9
		*	Acurate FL PR . 4	*	94	94	64		
	4	tests south	Inscurate PL PR-0			8	•	8	•
		Pand	Accepte 21. 78 - 0		8		8		
	-	dissil the	Inscurate PL PR-7				***	50	e4
10401	8		Acurate PL PR -20 inscurate PL PR-9	•	*	46	•0	•	44

We made three categories of visual acuity. First category named good included those patients, whose visual recovery 6/24 or more. In second moderate sategory include patients, whose visual recovery was 6/60 or 6/36 and in third poor category include the patients having hand movement or PL only.

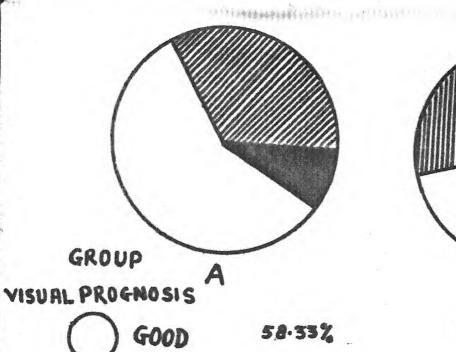
Table no. 14 ( shows visual recovery in 29 cases )

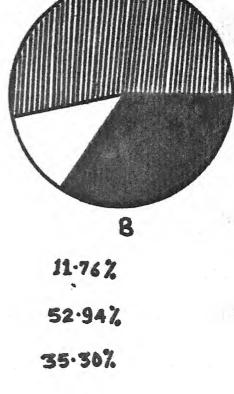
Sl.	Group	Duration of attack (days)	Total no.of cases	Good No. (%)	Noderate Noderate No. (%)	Poor No. (X)
1.	A*	annumentum anterioris del ferienza restato de mener	1.2	7 (58,33)	4 (33.33)	1 (8,33)
2.	8.0	6 or 7 6	17	2 (11.76)	9 (51.94)	6 (55.29)

\* Difference in final visual acuity in Group A & B significant at P value 2 0.05.

In group 'A' good vision obtained in 7 cases as compared to group 'B'. 2 moderate vision was obtained in 4 cases in comparison to group 'B' 9 cases and poor vision was in 1 case in group 'A', 6 in group 'B'.

Difference in the final visual acuity in Group 'A' and 'B' significant at P value \( \) 0.05.





Poo

POOR

MODERATE

9.34%

33.33%

GRAPH REPRESENTING THE VISUAL PROGNOSIS IN GROUP A & B

September 18

( Post-operative visual prognosis in relation to pre-operative intraocalar pressure in 29 eyes)

								isl pro			
Duration of attack		i g.	3	intraceult pressure mm / mg	10 2	£8\$	\$8 % \$8 %	6/18 6/36 6/26	00/07	×	22
Green - A		Acceptance of the Control of the Con			9						
/ 2 days		W		35.5	12033	640	pel		64		
3 - 5 days	9	-			9000	ed	m	9~8	**	9-4	9
Group = B											
6 - 10 days	9.45	10		32.66±	9906	1	44	m	60	9	
11 - 20 days	27.5	*		45.05+	6.40	0	94	414	64	8	•
7 20 days		-		50.67±	6.93	8		*	e=6	sife	94

Lens induced glaucoma is a condition to reckon within our ophthalmic patients from this part of the Country. The condition seems to be fairly common in our neighbouring districts. This may be due to the poor helth, education, lower socio - economic status illiteracy, poor geriatic care, fear of operation and ineccessability to ophthalmic surgeon by these patients.

This condition is acute in enset violent in its course, clinically recognisable easily treatable and also preventable.

This present study have been undertaken with the view of observing symptoms sings, effect of medical and surgical intervention, that is improvement in the visual equity after operation in the cases of lens induced glaucoma.

This series consisted of 36 patients of lens induced glaucoma, out of which 29 eyes were subjected to surgery for glaucoma as well as lens extraction, and followed up for fulb period. Seven eyes operated only for glaucoma.

#### Incidence :

In present study the incidence of lens induced glaucoma in relation to the total cataract operated in this institution during one year period is 10.6%.

Table - 1
The incidence of lens induced glaucoma in present and other previous studies.

il.	Study	Total no.of eataract operation	No. of cases of lens ind- uced glaucoma	perce-
***	Jain et el (1982)	2719	108	3.91
2.	Dher et al (1984)	6294	214	3,40
3.	Fresent study	339	36 3	0.6

The incidence in present study is much higher in comparison to the incidence of various workers, because the cases are smaller in number, people in this region are illiterate, very poor, does not know the meaning of health and living in the villages.

## wie and sex 1

The age of the patient varried from 35 to 80 years, with the M  $\pm$  5D  $\approx$  55.7  $\pm$  12.46 years which is similar to previous studies (Jain et al 1982, Dhar et al 1984).

The patients included in this study were more female with a ratio; of 1.12 female: 1.0 male, which to coinciding with those given in literature.

Age and sex incidence in present study and other privious studies

Sl.	Study	Aver- age Aver-	Total no.of cases studies	No. of male patient (%)	female patient (%)
2.	Flock's et al (1955)	70	138	82 (59,43)	56 (40.57)
2.	Jain et al (1982)	62	86	40 (46.57)	(53.49)
3.	Dhar et al (1984)	65.5	214	93 (43.46)	121 (56.64)
4.	Present study	55.7	36	17 (47.22)	19 ( <b>52.78</b> )

Maximum patients 66.66% belong to the rural and sub-urban area and only 33.33% came from urban area, indicate that this disease is much more common in villagers, which is comparable with other studies (Dhar et al 1984), we further observed that 34 (94.45%) patients belong to lower and lawer middle class, who are unable to consult a spacialist surgeon for their problem, and does not know that "prevention is better than cure".

#### Clinical feature :

The symptoms present in these cases given in observation table no. 4 are diminution of vision, eyeache, redness of eye, headache, nausea, vemiting, swelling of the lid and watering of eye are more a less similar to given in previous studies, Flock et al (1985), Jain et al (1982) and Dhar et al (1984).

In this study only 12 (41.37%) patients came within a week period of acute onset of disease and rest 17 (58.62) came after a week period. Cut of which 7 patients came after a month duration, which is a very detrimental factor in the visual prognosis.

The signs which are found on examination encumerated in observation table no. 5 are circumcilary congestion, dilated pupil and shallow amberior chamber were found in 190% cases intraocular pressure was raised in 35 (97.21%) eyes. In one (2.78%) case intraocular pressure was low inspite of shallow anterior chamber pupillary block and circum ciliary congestion.

The cause of this lowering of intraocular pressure may be the cyclitis, Duke Elder et al (1966). Deffective vision were found in all the 36 cases, out of which

29 eyes those are operated for both lens extraction and glaucoma 20 (60.97%) eyes have accurate projection while 9 (31.03%) eyes have inaccurate projection.

The iritis is present in 11 cases. Six cases are observed by geniescope and found that angle is open in all six cases prove that in phasetoxic glaucoms angle is open.

In 31 cases (86.11%) senile cataract and in
5 (13.89%) traumatic cataract was present. Out of 31
in 30 cases of semile cataract, the cataract was
present in the form of hypermature, or nature from
indicating that less induced glaucoma mostly occur due
to hypermaturation of cataract.

## Type of lens induced glaucoma :

this series is phasetexic glausoms (involving 29 (80.55%) of cases, including photolytic and phase -- emaphylectic glausoms. The second commencet causes is phasemarphic glausoms including glausoms due to pupi-- llery block associated with shellen intumescent or hypermeture estaract. Third cause is displacement (enteriorly) of lens as the result of traums.

Therefore, the phasotomic glaucoma due to hypermeturation of ceteract is the main cause of lens induced glaucoma. In hypermeture stage due to the capsular dehiscence the degenerated lens matter, expelled out into the anterior chamber resulting in the above consiquences.

#### Control of Introcular pressure s

All the cases were pre-operatively put on acetamelamide. In 14 (48.26%) cases instill the pilocarpine or timelel and, oral glycerol were given in 7 cases elenguith above treatment. In 8 cases were tension was not controlled by above, introvenous mannitel was administered prior to lens extraction.

In 12 (41,37%) eyes patient become normotensive following sector iridectomy and lens extraction. While in 17 (58,62%) cases performed combind extraction (filtering operation + lens extraction).

### Complications !

In this series of cases operated for lens induced glaucome, some complications were seen during the operation. These were blood in the anterior chamber in 1 (3.44%) case. The literature had only a few reports

with the blood in the anterior chamber as operative complication. Dhar et al (1984) reported 7.4% case had blood in the anterior chamber.

In this study rupture of the lens capsule takes place in 2 (6.89%) cases because lens capsule become very then 4 fregile or some time already rupture present in the lens capsule. Dhar et al (1984) reported 4.20% rupture of lens capsule.

In two (6.89%) cases vitreous disturbances occur in the form of vitreous prolapse - vitreous disturbance had been quite a frequent occurance during lens autraction in these cases, as evident from report of Dhar et al (1984) found vitrous prolapse in 3.27% cases.

onemon complication after surgery. In present study it common complication after surgery. In present study it common in 6 (20.86%) cases. During extraction of lens the lens matter releases act as foreign body and provoke a antigen satishedy reaction. Shallow anterior chamber was observed in 5 (17.24%) cases reformed by more than 3 days. In literature Dhar et al (1984) reported with delay in chamber formation by 3 - 5 days in 5.60% cases.

These observations are quite comparable to the previous reports. In one eye, however, during dislocated lens removal accidental injury to the iris took place.

#### Visual prognosis :

The visual acuity was ranging from doubtful perception of light to hand movement or better at preoperative examination. Out of 29 (100%) eyes, only
20 (68.97%) eyes had an accurate projection however,
rest of the eye 9 (31.03%) has inaccurate projection
rangind from doubtful perception of light to perception
of light. After operation, however useful visual acuity
was found to be present in 22 (75.86%) eyes ranging
from 6/60 to 6/12 or better with aphabic correction.

We observed that the eyes seem to be with stand reised intraocular pressure for longer period than expected.

of acute ettack recovered 6/12 visual acuity whereas only 14.28% of the eyes recovered this visual acuity in which the duration of attack lasted 3 - 5 days. Thus as the duration of attack lasted 3 - 5 days. Thus as decline in the recovery of visual acuity and beyond 3

weeks only light perception or hand movement could be observed. Out of 9 cases with inacurate projection of light one case obtained 6/36 vision having history of attack of 5 days, one eye had hand movement however in other 7 eyes with inaccurate projection presenting 3 weeks or more after the attack, 6 eyes could achieve only the hand movement or perception of light. Thus in a case of lens induced glaucoma, who present early, a good functional recovery can be expected despite an initial inaccurate projection of light.

If we categorise the visual prognosis as good 6/24 or better, moderate 6/60to 6/24 and poor HM to PL then results of visual prognosis of this series are shown in table no. 3.

<u>Table - 1</u>

Visual prognosis in present study & previous studies.

81.	Study	Eo.of cases	Good V.A. 6/24-2/12	Moderata 6/60-6/36	Poor HM to PL
1.	Jain et al (1982)	86	54 (62,8%)	20 (23,3%)	(13.4%)
2.	Dhar et al (1984)	214	169 (79,0%)	36 (16.8%)	(04.2%)
3.	Present study	29	(31,03%)	13 (44,82%)	07 (24,13%)

In the present study good visual aguity obtained in fewer member of cases in comparison to the provious studies because maximum patients came after long duration of agute attack.

#### Ophthalmoscopy :

Optic disc also showed changes which were significently related to the duration of attack of glaucoma,
upto 10 days of attack a large majority of optic disc
retained good colour. When the attack lasted more than
3 weeks nearly all the eyes developed pallor or atrophy
of the disc.



In the light of the present work and with a view of studies in the past from the literature the following can be concluded:

- (1) Lens induced glaucoma affected usually after 5th decade of life and commonly between 51 -60 years of age (N ± SD 55.7 ± 12.46 years of age).
- glaucems in relation to total semile cataract operated in the same duration is 10.6%, much higher than previous studies. 3.91% because people in this region are very poor, ignorant about health, and illiterate, live in the village and this disease is much commomer in poor, villagers.
- (3) If affected both the sexes, females out numbered the male with a ratio of 1.12 : 1.0.
- are gress diminution of vision due to cataract and glaucomatous attack, redness of eye, eyeache, circumciliary congestion, raised intraocular pressure, shallow anterior chamber and dilated pupil.

- therapy. The tension was reduced temporarily
  by mictics and ecetazolamide and them increased
  again. If the glaucoma is present and the
  pressure is under 30 mm. mg. do not hesitate
  to do a combined extraction because removal of
  the lens as Dr. Heath has stated brings relief
  in such cases.
- (6) In present study the most commonest type of less induced glaucoma is phacetoxic type (phocolytic and phaceanaphylectic) in 29 (80.55%) cases.
- (7) The most common types of complications occur
  during and after surgery in these type of
  cases were hyphaema, rupture of the lens capsule,
  vitreous prolopse and iritis etc.
- accuracy of light projection and final visual recovery were significantly related to the duration of the acute attack of glaucoma. A good functional recovery was obtained, if the attack lasted less than 3 weeks, beyond which only hand movement or perception of light could be recovered.

- (9) The condition of disc is also depends upon the duration of scute attack of disease.
- prognosis even in the apparently hopeless cases, if treated within a week of acute attack. Even in patient with the doubtful perception of light at admission good visual imprevement did takes place after adequate treatment.



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#### APPENDIX . I

DEPARTMENT OF OPHTHALMOLOGY, N.L.B. MEDICAL COLLEGE AND HOSPITAL, JHANSI (U.P.)

#### PROFORMA FOR CASE EXAMINATION

#### Case No.

Hame of the Paties	16 1	HRD NO.
Age / Sex	8	DOA
Ward/Bed	8	DOD
Address	8	(Improved/Death/Laman/
Oppupation	8	Abscanded/Hen improved
chief complaints		Durgtion

## chief complaints

1. 2. 3 . 4.

6.

- Rictory of present illness
- 1. N/o diminution of vision
- 2. No Pain
- 3. N/e Redness 4. Wo Reedeche

### Page Migeory

- 1. N/o Ocular trauma
- 2. We glaucoma
- 3. We Heusea/Vemiting 6. We Diabetes Mellitus

## EXAMINATION

## Coneral exemination

- males
- Blood pressure
- Temperature
- Mydration
- Cardiovascular examination
- Respiratory examination

# Local exemination of eye

Pece Bilateral Orbid & LAG Congestion

Symptrical/Asymatrical Normal/Shunken/Proptosed

Duration.

Deretion

Normal/Entropion/ectropion Conjunctivel/Circumoillany/ both

Cornes

Anterior chamber

Normal/Hasy

Normal/Shallow/Deep/Contentpus/blood/elear fluid/

Turbid fluid

Aqueous flair

Present/Non present

Iris Appearance Sympohia Normal/Atrophied/Coloboma/Hudy Present/Non present

Pupil Shape Sime Round/Ogal/Erregular Hormal/Constricted/Dilated

Fupillary restion

Normal/Diminushed/Absent

Lone

Position Appearance Normal/Sublumated/Dislocated Intunescent/Hature/Hypermeture Calcification present/Hot

present

VAGUAL ACUATY

Hand movement

PL

Present/Not present Present/Not present Present/Doubtful

Other eye - Normal/Imature cataract/Matura/Nypermature cat.

Investigations

Tension

Normal / Raised

(Digital)

Schlot's tonometry

k eye non Ng L eye non Ng

Slit lamp examination - Aquenus flair/present/non present Kp's present/Not present Indocorneal angle open/closed grade 0,1,2,3,4.

Conlescory

Urino - Albumin

Sugar

Medical Treatment

Local-

Systemic-

Surgical treatment

Post Operative complication

Follow up - Pundus examination -Tension - 15th day....mm Hg 3 month....mm Hg

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